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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • JUNE 12, 1943

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See Page 383

A SCIENCE SERVICE PUBLICATION

Do You Know?

In 1740, approximately 80% of the gainfully employed American population were engaged in *agriculture;* now the percentage is less than 20.

War industries furnishing their workers with one well-balanced nutritious *meal* per day find that they are insuring better employee health and efficiency.

Approximately 197,000,000 pounds of idle and excess *copper,* collected under the War Production Board copper recovery program, have been put to war uses.

Proper *seating* for industrial workers may increase output; the installation of sit-stand seats in a metal-polishing unit in one plant was followed by a 32% production increase.

A lethal insecticide, produced from the Chinese *yam bean* grown in Middle America, has been discovered at Cornell University; it promises insecticide material for 1944.

Apple syrup, a relatively new product, is produced by treating apple juice chemically and evaporating to proper consistency; a bushel of apples will produce half a gallon of syrup.

About 200,000,000 pounds of *binder twine* are used in the United States annually in harvesting machines; henequen and sisal fiber are normally used; cotton fiber is now replacing sisal needed in ropemaking.

Question Box

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

The feathers of the *bluebird* contain only brown or blackish pigment overlaid by a layer of prismatic cells which reflect only blue light rays; there is no blue pigment in bird plumage and very little green.

Flake *graphite,* a form of carbon, has many war uses as a lubricant, and in the making of crucibles, core washers, paints and electrical equipment; the principal sources are now in Alabama and Pennsylvania.

Coastal *Bermuda grass* and a Paraguayan strain of Bahia grass are being used on military fields in the southeastern states because they stand the wear of heavy boots, jeep tires and aircraft landing wheels.

Apparently due to the total failure of the *acorn* crop for the last two years, several species of birds that have been permanent residents of Yosemite Valley for the past twenty years left the valley during the past winter.

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MEDICINE

Fear-Worry Chemical

Still unidentified chemical found in the blood of worried or fearful people may account for way acute emotional upsets cause physical ills.

➤ DISCOVERY of a fear-and-worry chemical in the blood was announced by Drs. A. T. Milhorat, S. M. Small, E. J. Doty and W. E. Bartels, of New York, at the Clinical Research Meeting held at the New York Academy of Medicine.

This chemical, as yet unidentified, may account for certain physical changes that occur in the body during an acute emotional upset and may explain how worry or fear, for example, can cause symptoms of indigestion and even cramps, nausea and diarrhea.

The fear-and-worry chemical was discovered when blood from patients showing marked anxiety and fear was added in small amounts to a solution in which a loop of rabbit's intestine was being kept alive outside the body. The rhythmic contractions of the intestinal muscle were modified by blood taken while the owners were emotionally upset, but blood taken from the same persons after they had calmed down had no such effect on the intestinal contractions.

Blood from a man suffering from an acute mental disorder of the kind termed an anxiety psychoneurosis produced marked changes in the contractions, but after the patient had received psychiatric treatment and was recovering, his blood had less and less effect on the contractions of the rabbit muscle.

The nature of the fear-and-worry chemical has not yet been determined. It is an unstable substance, disappearing almost completely when the blood stands for 15 or 20 minutes after being taken from an emotionally upset person. The changes in muscle contraction it causes are not the relatively simple responses to adrenalin or acetylcholine.

Science News Letter, June 12, 1943

TB Germs Produce Booster

➤ DISCOVERY that certain tuberculosis germs when grown outside the body produce a booster chemical that increases the anti-bacterial action of the sulfa drugs was reported by Dr. Walsh McDermott and Miss Alice Tracy of Cornell University Medical School.

This is believed to be the first time that anyone has found a disease germ helping to boost the action of a sulfa drug in checking the development of other germs.

The scientists are now trying to learn the exact chemical nature of the booster and whether or not it increases sulfa drug action against other germs besides the one tested, which was the common intestinal organism, *Bacillus coli*.

The booster chemical stimulates the growth of *B. coli* when sulfanilamide is not present.

The same tuberculosis germs also produced another chemical which antagonized sulfa drug action exactly as p-aminobenzoic acid does. The antagonistic effect is masked by the booster effect at certain concentrations.

Science News Letter, June 12, 1943

Fighting Blood Clots

➤ A NEW WAY of using heparin, the anti-blood-clotting chemical, which may have life-saving usefulness in war surgery as well as in preventing thrombosis and embolism after operations, was reported by Dr. Leo Loewe and Dr. Philip Rosenblatt, of New York.

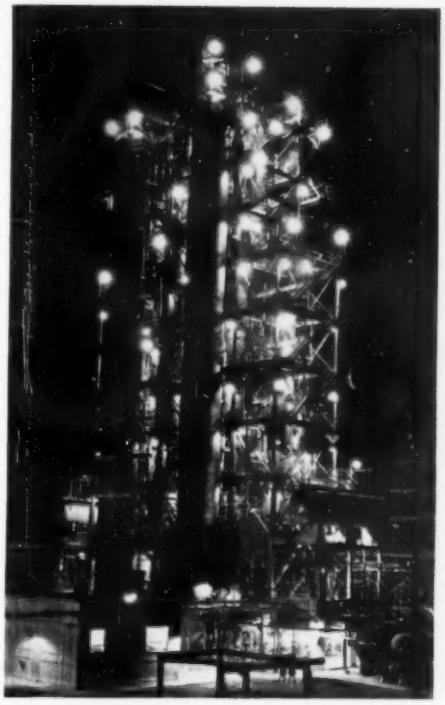
These doctors have found a way to deposit the heparin under the skin in what might be called banks of the anti-clot chemical. As a result it gets into the blood in a slow, even way, without dangerous runs or bankruptcies. The use of safe anti-blood-clotting treatment over protracted periods is thus made possible and practicable.

Science News Letter, June 12, 1943

Clawed Frog for Tests

➤ THE SOUTH AFRICAN clawed frog, a hardy animal from Capetown, is proving valuable for pregnancy tests, for assays of the potency of commercial sex gland preparations, and may "pave the way to untold discoveries in the realm of the ductless glands," Dr. Abner I. Weisman and Dr. Christopher W. Coates, of New York, told the medical society members.

Science News Letter, June 12, 1943



FOR RUBBER — This distillation tower reaching 20 stories into the sky is part of the $17,000,000 Monsanto styrene plant in Texas. When completed it will produce a large part of all the styrene from government-owned plants going into synthetic rubber.

MEDICINE

Mystery Disease Turns Up To Puzzle Army Doctors

➤ A MYSTERIOUS DISEASE for which no cause or method of getting it has yet been found turned up in some of the soldiers at Fort Bragg, North Carolina, late last summer (*Journal, American Medical Association,* June 5).

Lt. Col. Worth B. Daniels and Capt. H. Arthur Grennan, two former Washington, D. C., physicians now in the Medical Corps, Army of the United States, call the disease "Pretibial Fever, An Obscure Disease," in their report.

Fortunately the disease was mild. There were no deaths and only 40 cases. Because the men all were quartered near one another in a limited area of the reservation and had identical symptoms, it apparently looked as if an epidemic of some sort were brewing.

Chief features of the sickness were fever, lasting about five days, and a rash, which appeared toward the end of the fever and was usually located

over the inner, larger bone of the leg below the knee. This bone is the tibia, from which the disease gets its name, pretibial fever.

As soon as the fever went down, the men got well rapidly, with no complications, weakness or depression.

A commission of experts assigned by the Surgeon General of the Army to investigate the disease was unable to find any germ cause or any method by which the men might have gotten it. Members of the commission were: Dr. John R. Paul, of Yale University Medical School; Dr. Norman H. Topping, U. S. Public Health Service, and Major Cornelius Philip of the Army.

An outbreak of what may have been the same disease occurred in August, 1940, in Wrens, Ga.

Science News Letter, June 12, 1943

ASTRONOMY

Quadruplets in Sky

Far-off star, 59D Serpentis, which looks like one to naked eye, now believed to be really three or four circling in complicated dance.

By CHARLES A. FEDERER, Jr.
Harvard College Observatory

➤ QUADRUPLETS and quintuplets in the sky may not be as rare as they are on the earth, but astronomers get nearly as excited about them. At the meeting of the American Astronomical Society several papers dealt with multiple stars, among them a discussion by Mrs. Elizabeth Cornwall Tilley, of the University of Michigan, concerning the plain-seeming star known as 59D Serpentis.

Should 59D Serpentis be called single, as it appears to the naked eye? Or double, as it appears in a four-inch telescope? Or triple, as the spectroscope reveals one of its components to be? Or quadruple, as the sum of its parts would make it? But if quadruple is correct, the quads are not as nearly alike as they usually are among humans.

The star 59D Serpentis is also unusual in that two of its triplet stars are hot, white twins, while one is a cooler yellow star like our sun, only much larger.

One of the standard means for discovering doubleness among stars is to observe their spectra. If two stars are revolving around each other, some of their motion is probably toward and away from us, producing the well-known Doppler shift in their spectra. As one star approaches us along one side of the orbit, its spectrum is shifted toward the violet, while its companion's is shifted toward the red as that star recedes. Thus, two spectra are really being seen, and the lines in the combined spectra appear double. These double lines gradually blend as the stars proceed along their orbits, then separate again. This is repeated twice for each revolution they make.

Sometimes one star is so much brighter than the other that the second star's spectrum is suppressed and only one set of lines is seen. However, the regular oscillation of these lines around a mean position proves the star to be a spectroscopic double in any case. In only two or three cases, including 59D Serpentis, are three spectra visible, and only for 59D have the details of the system been determined. The white twins revolve around each other once every 1.85 days, at a distance apart of only four million miles. Together, they revolve around the large yellow star, about 180 million miles distant, or the distance across the earth's orbit, in 386 days. These three form the triplet, around which the distant visual companion, also a white star, may require several thousand years to revolve.

The triple spectrum of 59D Serpentis was discovered independently in 1938 by McLaughlin at the University of Michigan and Tremblot in Paris, and in some cases they took spectrum photographs of the star on the same nights.

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***SEWING MACHINE** — Radio-frequency current instead of needle and thread is used by this "sewing" machine to join plastic materials. Dr. George H. Brown, RCA scientist under whose direction the electronic machine was developed, shows a worker how to "stitch" a thermoplastic fabric. Although still in the development stage, the machine has possible applications to war production as well as postwar uses.*

"Rex-steel" is proposed as a name to replace "stainless steel" which indicates only its noncorrosive properties.

The new 199-mile oil *pipeline* across Florida will soon carry 30,000 barrels a day; Texas barges will unload gasoline at Carabelle, and Atlantic coast barges will load up with it at Jacksonville.

MEDICINE

Penicillin for Gonorrhea

New disease remedy from common mold found to bring rapid recovery after sulfa drugs failed. Because available only in limited amounts, should be last resort.

➤ RAPID RECOVERY from gonorrhea in three patients who had not been helped by sulfa drug treatment was achieved by the new disease remedy, penicillin, Dr. Wallace E. Herrell, Dr. Edward N. Cook and Dr. Luther Thompson, of the Mayo Clinic, reported in the *Journal of the American Medical Association* (May 29).

Penicillin, which is obtained from common mold similar to that which grows on bread, is available only in limited amounts. It should, therefore, the Mayo Clinic doctors advise, be reserved as a drug of last resort in treating gonorrhea.

Some strains of gonococci are so resistant to sulfa drugs that the patients fail to recover even with large doses and several courses of treatment. Laboratory tests showed that such sulfa-drug-resistant strains would yield to fairly small amounts of penicillin. The patients treated at the Mayo Clinic had been sick wi h gonorrhea for from five weeks to 11 months and all had had what would be considered adequate sulfa drug treatment.

They began to get better within a few hours, in one case within five hours, after the penicillin solution started dripping into their veins, and in from two to four days were able to leave the hospital completely free of the infection. Laboratory tests showed the germs had been banished in from 17 to 48 hours.

The penicillin was given by continuous drip into the veins. No toxic effects or discomfort to the patient resulted from the treatment.

Science News Letter, June 12, 1943

CHEMISTRY

Smoke Marks U. S. Tanks

Smoke in rainbow colors used in Tunisian campaign to distinguish tanks from those of the enemy. Research development prevents mistaken identification by our own bombers.

➤ "WATCH MY SMOKE!" becomes more than a slangy railroader's boast, in present-day cooperation between air and ground forces. With the Tunisian campaign safely over, a now-it-can-be-told story of rainbow-colored identifying smokes was sent back to the *Infantry Journal* (June) by Brig. Gen. Alden H. Waitt, who is with troops in North Africa.

Need for simple but sure means of identification by planes of tanks on the ground was made evident in the African fighting, when delighted British soldiers saw a lot of Stukas deliver a heavy attack on German tanks, which they had mistaken for British. Painting insignia on tank roofs, as they are painted on airplane wings, was thought of but quickly discarded because it defeated the whole system of camouflage, and in any case would be too easy for the enemy to imitate. Some quick-signalling code, that could be changed from day to day, was the thing really wanted.

Grenades giving off colored smoke were considered close to the ideal. The Chemical Warfare Service, after a number of months of research, developed suitable chemicals to produce six types of smoke, in literally all the colors of the rainbow: red, orange, yellow, green, blue and violet, together with two no-color smokes: black and white. Loaded in grenades, these can be set off in pre-arranged color-code pairs — say, yellow-blue for one day, green-red the next. Or one tank division or other body of troops might identify itself to supporting planes by a streamer of violet smoke, while its neighbor signalled in orange or white. Possibilities are seen as practically endless; the uses in the Tunisian campaign were only a beginning of smoke identification technique.

Tests have shown that colors can be distinguished from airplanes up to at least 10,000 feet. The signal has the further advantage of being visible only as long as it is needed: the grenade starts to give off its smoke in three or four seconds and continues for about three minutes.

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MEDICINE

Half Undulant Fever Cases Are Caused by Raw Milk

➤ YOU MAY BE HEARING a lot of talk about undulant fever since the death from it of Edsel Ford and you probably want to know more about it. The disease has several other names. One is Malta fever, because much-bombed Malta was its early home. Another is brucellosis, because it is caused by a germ named brucella after the British medical officer, David Bruce, who made the first intelligent study of the disease.

The most important thing to know about undulant fever, however, is that the way to escape it is to avoid raw milk, raw cream, and ice cream made from raw milk and cream. Pasteurization kills the germs. So does boiling.

About half the cases of undulant fever come from drinking raw milk from infected cows or goats. The other principal way of getting the disease is from intimate contact with diseased animals or their carcasses. Hogs as well as cows and goats may be infected, a fact which farmers, veterinarians, slaughter-house employees and butchers should know for their protection.

Chief symptom of undulant fever is weakness. The patient gets up in the morning feeling full of pep but by midmorning he is ready for bed again. He doesn't have much appetite, his digestion is poor. Intense and almost constant headaches, backache, pain in the joints like rheumatism, loss of weight and nervousness are other symptoms. Another unpleasant feature of the disease is its tendency to come in repeated attacks. These repeat attacks may go on indefinitely, with periods between when the patient may think he is well and over it.

The disease causes considerable disability, suffering and economic loss, but fortunately is not often fatal. One authority reports deaths at the rate of three per 100 cases in those he studied. When caused by the hog variety of brucella germs, the infection is more severe and the outlook less favorable.

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PHYSICS

Advantages of Radar

Excells older sound detectors in speed, accuracy and distance. Short electromagnetic waves, reflected like a sound echo, return from object with speed of light.

➤ THE ADVANTAGE of radar over the old sound detectors is a matter of speed, accuracy and distance. The short electromagnetic waves from the transmitter used in radar travel at a rate of 186,000 miles a second, the speed of light. Sound travels at the rate of only about 1,120 feet per second at ordinary temperatures.

Radio waves are reflected from an object in much the same way as sound waves in an echo. The shorter the radio wave the clearer the reflection. Radar beams may be directed at a definite object. They do not scatter as do the waves from the radio in the ordinary broadcast.

The history of the development of the radar stretches back at least two decades. Apparatus developed and constructed by the Westinghouse Electric and Manufacturing Company, installed for the armed forces at Pearl Harbor, detected the approaching Japanese planes some 30 minutes before they attacked on Dec. 7, 1941. Westinghouse is reported to be producing more than 40 times as much radar equipment and other communication apparatus for military use as in 1940.

"The ordinary commercial broadcast is made at frequencies of from 550 to 1,600 kilocycles per second, which corresponds to wave lengths of 187 to 550 meters," stated C. J. Burnside, manager of the Westinghouse Radio Division. A kilocycle represents 1,000 cycles or wave-crests a second. The frequency of the ordinary broadcast is from 550,000 to 1,600,000 cycles or crests per second. "As waves get shorter and shorter," he added, "they tend to merge into heat radiation, and shorter than that into light. It is this tendency that makes possible the transmission in beams of ultra short waves."

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PUBLIC HEALTH

Health Record in Africa

Only 37 of 1,300 personnel of new airline to Africa, Middle East and India have been sent back to the United States for medical reasons.

➤ ONLY 37 of the 1,300 airline personnel sent to Africa during the first 14 months of Pan American Airways-Africa, Ltd., operations had to be sent back home for medical reasons. None of the 37 were seriously incapacitated.

This health record of the new airline was achieved in operations across a part of the world so unhealthy it is known as the "white man's grave." How it was accomplished is told by the airline's medical department in *War Medicine* (May), published under the auspices of the American Medical Association and the National Research Council.

The record is the more remarkable because the airline went into operation so fast there was no time to make preliminary surveys. Within 60 days after a decision had been reached in the United States, the line was transporting military personnel and equipment across Africa for the United Nations, operating under U. S. Army contract. Later the line was extended through the Middle East to India, and there were also many unscheduled flights.

Reasons for the medical discharges of the 37 men who had to be sent back home are given as: peptic ulcer, 8; malaria (recurrent attacks) 5; strained back, 4; alcoholism, 2; psychoneurosis, 2; chronic otitis media, 2; pulmonary disease, 2; dermatitis, 2; and miscellaneous conditions, 10.

Of all the tropical diseases that abound in the regions covered by the airline, only malaria and dysentery gave any real concern. Because the line was so hurriedly assembled and the men had to be sent into highly malarious areas without proper protective measures, a major epidemic occurred within a few weeks of their arrival at one station. Between Oct. 1 and Dec. 26, 1941, an estimated 1,894 man-days' time was lost among 300 men. Use of this station was discontinued.

Screening of quarters and the use of bed nets are among the measures credited with protecting the airline personnel against malaria. Bed nets alone are not sufficient, the report emphasizes, because: 1. The malaria mosquito may bite through the net; 2. the nets do not protect during the most dangerous periods between dusk and bedtime and between early arising and daylight in the morning.

Spraying of European and native quarters with insecticides and draining and oiling and dusting mosquito breeding areas with Paris green were other measures used to fight malaria.

Daily prophylactic doses of quinine, and later of atabrine, were given the men. Atabrine appeared to be as effective as quinine and no toxic effects were noted.

Atabrine was not found to limit the aviators' ceiling when given as prophylaxis against malaria. If men are sick and getting larger doses for treatment, they should not be permitted to fly.

Long trousers, long-sleeved shirts and mosquito boots were required evening attire, to be donned after a shower at dusk. This costume was found to protect the men when away from camp or outside the screened quarters.

Personnel of the airline's medical department includes: Dr. L. T. Coggeshall, Senior Medical Officer; Dr. A. Yeomans; Dr. J. F. Rogier; Dr. O. Pearson; Dr. George Jones; Dr. Robert Tucker; Dr. Gordon Jones; Dr. L. Eliel; Dr. W. Jagard, (dentist); and F. Snyder, entomologist, all stationed in Africa, and Dr. F. Shillito, and Dr. Seymour Fiske, stationed in New York.

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The 1942 total production of recoverable *copper* in the United States was over a million tons, an increase of 12% above 1941.

Recent archaeological studies of the *Canari Indians* of southern Ecuador made by the Field Museum uncovered burials, remnants of houses, and large refuse deposits left by the prehistoric inhabitants.

A new thermosetting *lignin* plastic, made from farm wastes such as cornstalks, wheat straw and flax shives, is announced by the U. S. Department of Agriculture.

NUTRITION

Drink Steak in Diet Study

Students get their beefsteak in lemon-flavored drink in studies shedding light on diet requirements. Some amino acids found non-essential.

➤ WHILE most American civilians have been struggling with red meat shortages and red point coupons, 12 men graduate students at the University of Illinois have for the past eight months been getting their beefsteak, or rather, its nutritional equivalent, in a lemon-flavored drink.

The men voluntarily assumed the role of human guinea pigs in order to aid studies of human requirements for amino acids. The studies were reported at a meeting at the Nutrition Foundation in New York by Prof. William C. Rose, biochemist and acting head of the University of Illinois chemistry department, who has studied amino acids for 20 years and is an international authority in that field.

Amino acids are often called the building blocks of proteins, the food constituents found in meat, eggs, milk, cheese, cereals and some vegetables. Of the 22 known amino acids, 12 have been known to be not essential for animals.

The human guinea pigs at the University of Illinois helped prove that these same 12 are non-essential to humans. Of the other 10, eight that are required by animals are now known to be essential also for human diet needs. One, histidine, is essential for animals but not for humans. One more amino acid remains to be tested.

Instead of eating meat or other protein foods, the 12 human guinea pigs drank solutions of the amino acids in distilled water flavored with lemon juice. The rest of their diet came in the form of special crackers spread with purified butter, cod liver oil and vitamin pills.

This diet contained all the food elements in proper proportions to maintain weight and the nitrogen balance of the body. Determination of the nitrogen balance is a method for telling whether or not a person is getting enough of the right kind of proteins in his diet. By omitting the amino acids, one at a time, from the protein drink, and following the weight and nitrogen balance, the question of whether or not a given amino acid is a diet "must" could be determined.

Studies of human amino acid requirements are of particular importance now because of the world-wide meat shortages which are likely to continue for some time to come. Meat and other foods derived from animal sources contain all the amino acids heretofore believed to be essential for human diets. When nutritionists have to plan adequate diets with little or no meat, they can do the job more successfully if they know, from studies such as Prof. Rose's, just which amino acids are required and must be furnished by other protein sources, for example, peas, beans and cereals.

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AERONAUTICS

Plywood Uses for Planes And Gliders Held Limited

➤ PLYWOOD cargo planes and gliders will fly post-war airlanes; plywood will fill a host of industrial needs. But it isn't going to replace all other materials and no one should expect it to do more than nature gave it strength to do, James J. Dunne of the United States Plywood Corporation warns in a report to the American Society of Mechanical Engineers.

Although new plastic glues have produced eye-opening results for plane designers, there is no such thing as the much publicized "plastic plywood," Mr. Dunne explains. There isn't any such thing as a plastic plane.

Aircraft plywood is nothing more than layers of veneers bonded together with a waterproof, fungus-proof plastic, usually phenol formaldehyde resin. The finished product is only about 10 per cent plastic.

When aluminum became scarce, plywood was called upon to fill the gap overnight. Design data either were not available or out of date. Much money has gone into futile samples that never had a chance, Mr. Dunne declares.

Many problems have been solved but Mr. Dunne believes that the wood aircraft program needs coordination. There should be some plan for distributing the work to qualified plants in localities where the labor problem is least critical.

A clearing house should be set up, he urges, so that plants that have facilities and are capable of quality work shouldn't have to go begging for business when there is so much to be done.

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PHYSICS

Miniature Turntable for Taking-X-Ray Pictures

➤ NEW AID TO DOCTORS trying to locate and remove foreign bodies such as coins and safety pins lodged in the lungs is expected from an X-ray machine newly installed at the University of Pennsylvania Hospital.

Chief feature of the new X-ray machine is the miniature turntable incorporated in it which enables the doctor to change the patient's position so that the pictures can be made from any angle, even vertical, without lifting or turning the patient bodily.

The machine is called a biplane fluoroscope because with it examinations can be made and X-ray pictures taken in both horizontal and vertical planes. It was made by the Westinghouse Electric and Manufacturing Company.

Science News Letter, June 12, 1943

TURNTABLE — This miniature turntable is incorporated in the X-ray machine. Physicians may thereby change the position of a patient at will during delicate operations to remove foreign bodies from the lungs

ASTRONOMY

Double Star Discovered By Canadian Astronomer

➤ A LARGE NEW double star has been discovered by Dr. J. A. Pearce, director of the Dominion Astrophysical Observatory. It is the spectroscopic binary, HD 34333, an eighth magnitude star in Auriga.

Each part of this new system is a star having 23 times the mass of the sun and revolving around the other in slightly over 4 days, Dr. Pearce reported to the American Astronomical Society. Its orbital velocity is about 150 miles per second, and as one star passes between us and the other, it may produce a very slight partial eclipse, which Dr. Pearce predicts, but which has yet to be observed. Probably the light changes are small, but Dr. Pearce suggests accurate observations of the star's light to see if there occur any periodic variations which would be caused by such eclipses. The present distance estimate places the system 3,500 light-years from the sun.

Science News Letter, June 12, 1943

ASTRONOMY

Amateur Astronomers Watch Variable Stars During War

➤ AMATEUR ASTRONOMERS have not let the war prevent them from keeping tabs on their favorite variable stars, Leon Campbell, recorder of the American Association of Variable Star Observers, told astronomers. Although reports from foreign countries have been curtailed, the vigil of the celestial "blinkers" is still going on in America, and undoubtedly many European observers are keeping their observations recorded until the day when they can be safely sent over here to be combined with others made about the same time.

Speaking before the 70th meeting of the American Astronomical Society in Cambridge, Mass., Mr. Campbell reported on an analysis of more than half a million observations made by amateurs during the past 20 years and involving 400 long-period variables. These are stars which take from 50 days to several years to go through their cycles of light fluctuations, some in a predictable, some in a very eccentric manner.

A large proportion of the stars remain for months at a certain brightness (minimum), then suddenly increase in light to a maximum, frequently more than 100-fold, remain at maximum only a relatively short time, and then more slowly return to minimum. Practically all of these variables are red stars with comparatively low surface temperatures, much cooler, for instance, than our sun.

Mr. Campbell credits hundreds of observers, not only in the United States, but in all parts of the world, and he says the observing of variable stars is one field of astronomical endeavor in which the amateur can seriously serve.

Science News Letter, June 12, 1943

MEDICINE

Avoid Handling Pets Which May Be Carrying Poison Ivy

➤ IF YOU ARE susceptible to poison ivy, remember to beware of dogs and pets that run about outdoors. They may in their wanderings brush against the poison ivy plants and bring home the chemically irritating principle on their fur. Anyone who then strokes the dog, cat or other pet, or lets the animal rub up against bare ankles or legs, may come down with ivy poisoning, if susceptible to it. Such contacts may account for some of the attacks in people who have carefully avoided the plant itself.

Persons susceptible to this miserable blistering and itching skin ailment can get it merely by shaking hands with someone who has handled the plant, unless the second person has washed his hands after handling the plant. So be chary about how you greet friends who have just come in from a country ramble or from working in the garden. Touching shoes, clothes or tools that have touched the plant can also bring on an attack.

Spring and early summer are the worst poison ivy seasons because the sap is then most abundant. Dead, dry plants, however, and especially the smoke from burning plants, can cause the poisoning. Have someone make sure that any logs gathered for next winter's fireplace don't bring the ivy poison along with them.

Several kinds of chemical armor against ivy poison have been developed for use before going into the woods or other places where the ivy plants are likely to be encountered. Latest of these are two ointments worked out by scientists of the U. S. Public Health Service. They have also developed a new treatment your doctor may want to try in case you are unlucky enough to get an attack of poison ivy.

Science News Letter, June 12, 1943

IN SCIEN

ENGINEERING

High-Speed Motion Pictures Used to Study Weapons

➤ HIGH-SPEED movies are being used to increase the efficiency of our fighting men by helping to develop improvements in mechanical devices of war.

Captain E. M. Watson of the U. S. Air Corps reported to the Society of Motion Picture Engineers that the pleasure-giving camera analyzes performance of fighting equipment that operates at a speed far too rapid for the human eye to follow.

A high-speed motion picture of the firing of a gun, when one side of the gun has been removed, makes it possible to study the loading of ammunition.

Once the rapid-fire motion of the device has been "caught" by the camera, the rate at which the film is shown can be slowed down to suit the human eye. Captain Watson illustrated this by showing motion pictures of a gun in action.

From the motion picture, individual and sequence still pictures may be made and curves plotted to show the action involved. These assist technical men with testing and research.

Science News Letter, June 12, 1943

RESOURCES

Russian Dandelion Grown For Rubber in Canada

➤ CANADA'S SUPPLY of natural rubber may be augmented by crude rubber obtained from the roots of the Russian dandelion, current experiments indicate.

The Dominion's Department of Agriculture first planted seeds of this dandelion, known as kok-saghyz, in the spring of 1942. Quarter-acre plots were used at eight experimental stations across Canada.

An average of 5,100 pounds of roots per acre was gathered. The experimental farm in Kentville, Nova Scotia, topped the list by producing 8,100 pounds of roots. Rubber content from the roots was found to vary from 2 to 7 per cent.

Science News Letter, June 12, 1943

NCE FIELDS

MEDICINE

Appendix Found to Serve As Germ Trap in Rabbits

➤ THE APPENDIX, generally considered a useless and frequently troublesome appendage to man's digestive system, apparently serves a useful function to the rabbit.

In these animals it acts something like a germ trap, it appears from a report by Dr. Frank Baker and Dr. John Ensticknap, of the County Technical College at Guildford, England (*Nature*, May 8).

The scientists have found in the appendix of the rabbit many of the scavenger cells which the body uses to dispose of unwanted microorganisms. The scavenger cells contained numerous bacteria.

Whether these scavenger cells in the rabbit's appendix act as a protection against disease or as an aid to rabbit nourishment is now being investigated. Some bacteria in the intestinal tract contribute to nutrition by manufacturing some of the vitamins.

Science News Letter, June 12, 1943

MEDICINE

Eye Infections Threaten Soldiers in Tropics

➤ EYE INFECTIONS from trachoma to "pink eye" are hazards to the United Nations forces fighting in tropical and subtropical regions. Tests for helping to diagnose these conditions which clinical pathologists may be called on to make were reported by Dr. Charles Weiss, of Mount Zion Hospital, San Francisco, at the Chicago meeting of the American Society of Clinical Pathologists.

Infections of the delicate membrane lining the eyelids and covering the eyeball in front are very common in the tropics, Dr. Weiss said, because of the excessive heat, dust and sunlight, crowding, filth, lack of water, malnutrition and vitamin deficiencies.

"It is a common sight in Tunis, for example," he said, "to see Arabs with forehead and eyelids covered with flies which are feeding on pus exuding from infected eyelids. These superstitious people will not kill an insect, since they believe that the soul of an ancestor may have lodged within one. With summer and fall temperatures ranging from 90 to 132 degrees Fahrenheit, it is not surprising that flies can transport the infection from the eye of one person to that of another," he commented in referring to the prevalence of gonorrheal ophthalmia in both children and adults in the tropics.

Trachoma, he said, takes precedence over other diseases as the cause of blindness and human misery in tropical and subtropical countries.

"Shipyard conjunctivitis" is another tropical eye disease, having originated in India, Malaya, Tasmania and Hawaii.

Smallpox, the germs of syphilis, gonorrhea and lympho-granuloma venereum, bacillary and amebic dysentery, rat-bite fever, yaws, plague, cholera, typhus fever and malaria are among other eye hazards of the tropics described by Dr. Weiss.

Science News Letter, June 12, 1943

MEDICINE

Wearing G. I. Shoes Cure for "Deck Ankles"

➤ Rx FOR SOLDIERS about to embark for foreign service: Wear your G. I. shoes while on the transport, to avoid getting "deck ankles."

That is the name British naval surgeons have given a new ailment they find afflicting men who wear gymnasium shoes on troop ships, the London correspondent of the *Journal of the American Medical Association* (May 29) reports.

Wearing boots (Americans call 'em high shoes) is a specific cure for the condition, they found.

Swelling, aching and stiffness of one or both ankles on about the tenth day of the voyage and tired feet, especially at the end of the day, are the symptoms of "deck ankles." The cause, it is suggested, is slight injury from walking on hard decks and repeated small twists of the ankle when going up and down hatchways while wearing gymnasium shoes. Varicose veins, sunburn, and lack of seasoning among the troops were aggravating factors.

Men who went back to boots, with the greater support for the ankles, got over their "deck ankles" in five days, while it took twelve days for those who continued to wear gymnasium shoes.

Science News Letter, June 12, 1943

RESOURCES

Seaweeds Investigated As Sources of Food

➤ SEAWEEDS, long neglected by Americans as land weeds, are now under close scrutiny at the University of California as possible sources of food. In rather crude form, they are traditional articles of diet in Japan; and it is considered not impossible that with better processing they might be made palatable to Americans and Europeans.

In the botanical laboratories a Chinese scientist, Dr. C. K. Tseng, has transplanted a number of species from offshore rocks to tanks of sea water where they can be studied under known and controlled conditions. His idea eventually is to establish a "submarine agriculture," with large-scale cultivation and regular harvesting methods.

A South African botanist now at the University, Dr. George Papenfus, states that several seaweed species along the coasts of his native land have been found to be good sources of agar, a kind of vegetable gelatin needed for laboratory culturing of bacteria and other microorganisms. Before the war, agar was supplied practically altogether from Japan, and the lack of it has been a serious handicap in hospitals and research laboratories.

Science News Letter, June 12, 1943

STATISTICS

Wedding Bells Now Ring Oftener in Far West

➤ THE WAR is changing the influence of geography over marriage, making wedding bells ring more often in the Far West and not quite so frequently in the South, statisticians of the Metropolitan Life Insurance Company report.

"In this country as a whole, about six out of every 100 men or women of marriageable ages wed during a typical year," the report states.

For the South, the figure has been almost nine out of 100, and for the Far West it has been somewhat under five out of 100. The North has been about halfway between. Now the West is having more marriages, especially in the ages under 35, while the South is having fewer.

An increase in marriages among the older people and fewer marriages among younger ones is predicted for the future as a result of the war.

Science News Letter, June 12, 1943

NUTRITION—AGRICULTURE

Food for Europe

Food shortage in war-stricken countries is not so black as it has been painted, but bad enough. Food there has declined in quality as well as quantity.

By DR. FRANK THONE

➤ EUROPE under the Nazi heel is not the black famine area it has often been pictured. Everybody on the continent has to do without things, millions are habitually hungry, but not everybody is starving. When our relief fleets at last steam over the sunken wrecks of the last of the U-boats into the liberated harbors of the Continent, they will not have to restock a bare-swept pantry, but only replenish a badly depleted one. It may mean the difference between accomplishing a difficult task and recoiling before an impossible one.

That, at any rate, seems the prospect offered by a careful statistical study of Europe's wartime food economy, made by Dr. J. H. Richter of the U. S. Department of Agriculture, and recently made public by the Department's Office of Foreign Agricultural Relations.

Dr. Richter's study actually covered all of Europe west of Russia; but since the Fascist grip extends over all that area with the relatively small exceptions of Sweden, Switzerland, Spain and Portugal, the figures may be taken at face value. The more so, because the pinch is felt even in the unoccupied and neutral countries—lightly in Sweden, tightly in Spain, which has not yet recovered from the fever of civil war.

Large Cereal Imports

Western Europe's annual food imports in pre-war time included cereals enough to make about 3,000,000 tons of flour, 500,000 tons of sugar, 1,600,000 tons of food oils and fats, and some fruit. Great quantities of feed for dairy and meat animals were also imported, sufficient to produce about 1,300,000 tons of meat, 700,000 tons of food fats, and 100,000 tons each of eggs and cheese. There were relatively small food exports—approximately 100,000 tons each of eggs, cheese and meat.

To get some kind of an integrated figure, Dr. Richter has converted all classes of foods into their caloric equivalents and struck a total, which comes out at 37 trillions—30 trillions for imported plant foodstuffs, 7 trillions for foods of animal origin.

This seems tremendous until it is compared with Europe's total food consumption, calculated as the equivalent of 360 trillion calories a year. Foodstuffs of extra-Continental origin therefore amounted to only about 10% of the total: Europe was much closer to being self-sufficient in peacetime than we Americans were accustomed to think.

There has of course been a decline in European farm production since war broke out. Relatively little of this, in the area under consideration, has been due to actual "havoc of war"; principal factors have been manpower and horsepower shortage, unfavorable weather, lack of fertilizers. About five-sixths of the former imports of foodstuffs and feedstuffs have also been cut off, so that there is probably a total wartime supply of about 319 trillion calories, as against the over-all pre-war total of 360 trillion.

Fighters Need More

But there are some 14 million men under arms in wartime Continental Europe, and they must have more food than their peacetime requirements, rather than less. As Dr. Richter figures it, the average European gets perhaps 84% as much to eat, measured in calories, as he did before the New Order conferred its choicest blessing, war, upon an unappreciative world.

The trouble with this kind of a figure, as Dr. Richter takes care to point out, is that there isn't any "average" European, any more than there is an actual "average" person of any kind. The 84% of civilian-available supplies are most unevenly distributed. The relatively well-fed, meat-eating Swede in the North is far better provisioned than the chronically malnourished Sardinian in the South at any time, and the contrast becomes sharper when one is still at peace and the other embroiled in an exhausting war.

Even within the bounds of any given country, maldistribution makes itself strongly felt. This may be due to a poor transportation system backed by a weak national economy, as in Italy, or it may be simply the result of the farmer's stubborn refusal to turn over his produce to city populations which have nothing to give him in return. This was decidedly the case in Germany during the Kaiser's war; it is probably as true there today, in Hitler's war.

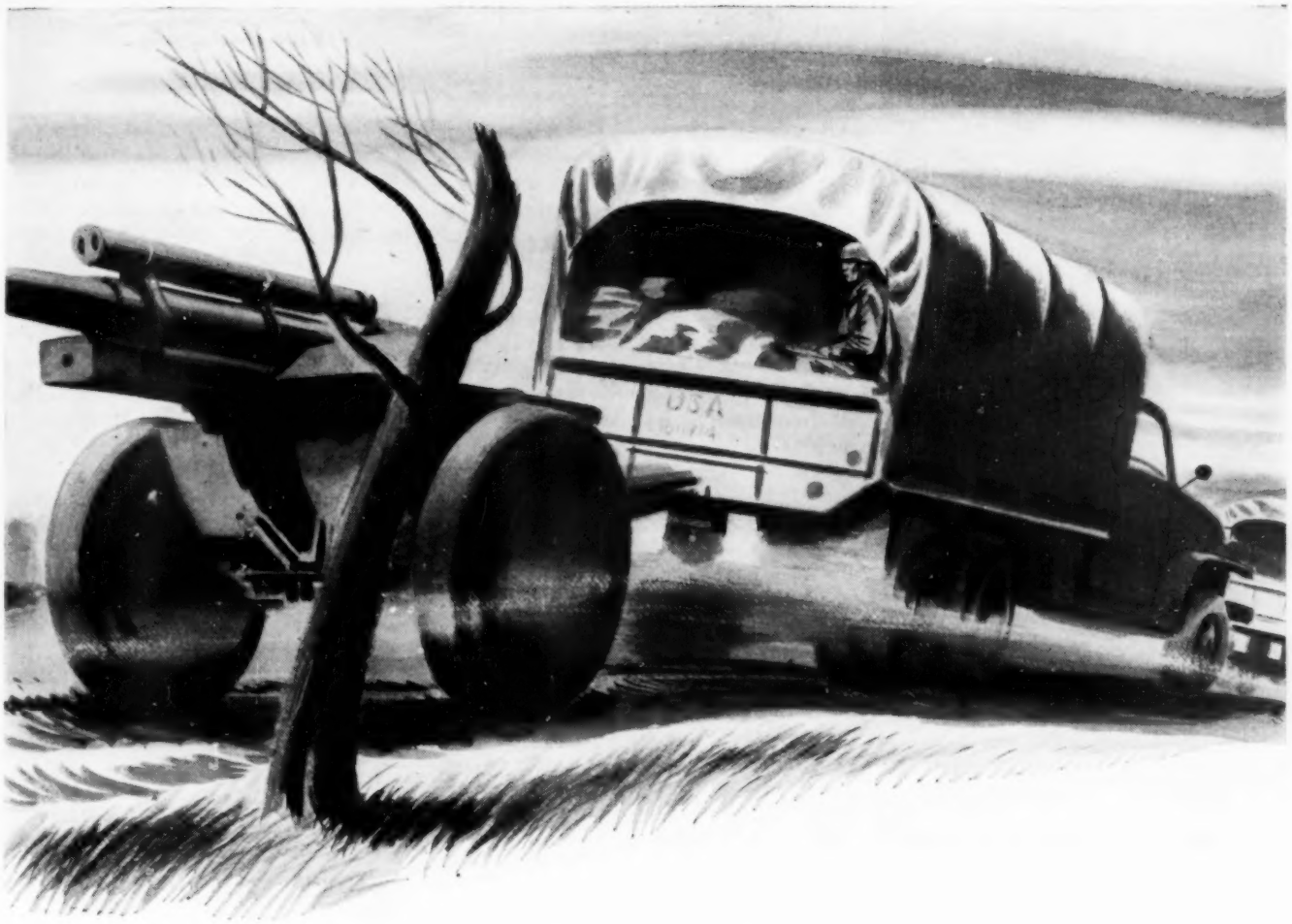
When rotund Herman Goering offered the German people guns instead of butter, he did not actually make the substitution altogether so inedible. Since there was to be less butter, fewer cows would be needed. The people might dip into Bossy's abandoned bran-bucket to fill their porridge-bowls. Some such sour parable as this might be taken to illustrate one aspect of the searching study of Continental Europe's wartime food balance carried out by Dr. Richter. The diet of people in war-bound Europe has suffered qualitatively as well as quantitatively. It is coarser as well as scantier, and there has been an even sharper cut in the flitch of bacon than in the size of the brown loaf.

Stated in round, integrated totals, European food in general, before the war, was about 78% of vegetable and 22% of animal origin. As of 1941-42, the last crop year for which any kind of figures are available, the proportions are 83% vegetable, 17% animal. And be it not forgotten that the total quantity of food is less, so that the 17% of meat and butter and eggs and cheese is 17% of very little indeed.

Italian Diet Skimpy

Even this skimpy proportion is ill-balanced, for the peoples of the harder-climated North, like the Scandinavians and the Dutch, have always been heavy meat-eaters, while the poorer folk of some of the Mediterranean and Balkan countries got along with very little food of animal origin. So the "average" figure of 17%, skimpy as it is, must be further trimmed to give an accurate idea of how often the peasants of Italy see meat on the table nowadays.

Of course, in all these calculations, one has to leave out of account the horror-spots that the Nazis have deliberately created, like Poland and Greece, where whole peoples seem to have been condemned to death by starvation for the crime of having defended their homes. Better omitted, too, were pictures



Speaking of superior races . . .

EVERY WHEEL that rolls on the battlefield turns in a polished bearing race, ruggedly built to take the terrific shock of combat service.

To withstand such punishment, bearing races must be hardened by heat-treatment. Hard and soft spots occasionally occur. Such races may fail—at times when failure means disaster.

Recognizing the vital need, Westinghouse Research Engineers set to work to develop a quick, sure method of detecting these flaws.

Their ingenious electromagnetic flaw-detector is based upon the fundamental law that the *permeability* of a heat-treated steel part varies with the degree of hardness.

In actual practice, the bearing race is *completely* demagnetized. Then it is rapidly rotated and strongly magnetized. While the race is still turning at high speed, its magnetic field is explored with a specially designed electromagnetic "pick-up."

Variations in the magnetic field of the bearing race, due to hard or soft spots, induce feeble currents in the pick-up system. These currents are amplified and shown visibly on a cathode-ray oscilloscope.

A uniformly heat-treated bearing race traces a *luminous straight line* on the oscilloscope screen. Faulty heat-treating shows up as a pattern of *hills and valleys*.

The electromagnetic flaw-detector is now being used commercially—a typical example of Westinghouse *electronics at work*.

It assures quality in millions of bearing races for our armed forces, to keep 'em rolling on to victory!

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania.

Electronic fingerprints — A Westinghouse Research Engineer demonstrates the principle of the electromagnetic flaw-detector. Hard spots in the steel test piece show up as an irregular line on the oscilloscope screen.

Westinghouse *Electronics at Work*

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

of Party members in both Germany and Italy who remain sleek and well-nourished while even their own compatriots are on strict war rations.

Even leaving obvious and gross inequities like this out of the discussion, Dr. Richter sees perhaps 60% of Europe's people having to subsist on three-fourths of their normal diets—remembering always that the "normal" diets of many millions of these people have been far from what dietitians would call normal for anybody.

What will our task be when Europe is cleared of its present nightmare and begins its terrific task of getting back on something like a normal basis?

First of all, Dr. Richter holds, we should think of helping European peoples to help themselves. Supplies of seed and farm machinery, of draft animals and livestock, are the greatest benefits that can be offered. Some of the countries, most notably Denmark, have been permitted to keep a good nucleus of breeding animals; they will need mainly a resumption of shipments of oil-cake, grain and other feeds. Others may need help in getting destroyed dairy and stock industries rebuilt from the ground up.

But for immediate needs, especially in the sorest famine spots, prompt shipment of all kinds of foodstuffs will be imperative. These, as Dr. Richter sees it, will have to be given priority over livestock feedstuffs, into certain areas at least.

Science News Letter, June 12, 1943

MEDICINE

War Disease Problems

Deaths from wounds likely to be many fewer than the deaths from war diseases, bacteriologist points out. Malaria an important problem.

➤ DISEASE AND INFECTION present gigantic problems to our armies fighting a global war, Prof. K. F. Meyer, head of the department of bacteriology at the University of California, told the Western Section of the American Chemical Society meeting in San Francisco. In wars, Prof. Meyer pointed out, there has often been a much higher mortality rate from disease than from wounds. In the Crimean war, for example, there were 50 deaths from wounds to 192 from disease, while in the 1914-1918 World War the relation was 138 due to wounds and 115 from disease.

Not only is there the question of the health of the troops during the war, but of contacts among the home population when peace comes. When all these men come back, Prof. Meyer said, we shall have carriers of all sorts of diseases. We must be prepared in civilian set-ups for possible eventualities. We remember that 1000 people died of cholera in one month in Sacramento, Calif., during the '49 gold rush. The Army and Navy Medical Corps, working in conjunction with committees of the National Research Council, are developing every possible means of reducing the impact of these diseases to a minimum.

In the offices of the Division of Medical Intelligence there are on the walls maps of the world showing last minute data on the location of the various communicable diseases. Extensive outlines of the diseases likely to be met are prepared and given to medical officers before embarkation to the battle front.

In North Africa, diphtheria appears in the form of skin ulcers which do not heal. In the caves of Tobruk there were sandflies and ticks that transmit fever. In Trinidad there are vampire bats. About 4% of these bats carry the rabies virus in their saliva. They bite the peoples' toes at night and the rabies appears as an ascending paralysis that looks in many ways like infantile paralysis. It was necessary that the bat population be reduced. This campaign and one against the mosquitoes in that region were planned by the Medical Intelligence.

"Among the so-called 'filth' diseases, typhoid is licked since all troops get immunization," Prof. Meyer said. "But when our boys come home they may bring back dysentery in various forms."

Dysentery vaccines are being studied but they are still in an experimental state. Sulfaguanidine has revolutionized the treatment. This disease will have to be controlled by environment, such as suppression of flies and proper disposal of excreta. This means continual vigilance.

We shall also have contact with cholera, Prof. Meyer pointed out, since we are going close to the birthplace of cholera in the Ganges delta. There is a vaccine but the degree of protection afforded is not definitely known. The Japs have used cholera vaccine since 1904. In fact, the best strain is a Japanese strain. The disadvantage is that revaccination is necessary every three months.

Among the insect-borne diseases we find malaria, which is more frequent in the tropics. This disease is not conquered. We need a real prophylactic. We now have only a suppressive, and a person may carry malaria for years in his blood. The control of this disease will have to be through control of mosquitoes. But how can any one prevent them from breeding in the hills, for example, of the Owen Stanley Mountains, or in West Africa? The medical officer can only see that the men sleep under mosquito nets and charge the atmosphere of the tents with insecticidal spray.

Against yellow fever the army has a vaccine which gives 100% protection.

Bubonic plague is always a possibility. This scourge has played an important role in many previous wars. It is insect-borne but once started may be passed from man to man in the pneumonic form. Both a vaccine and sulfa drugs may help fight plague.

Typhus is an ever-present threat. The British found typhus in Egypt. It is apt to be in any country where the population is louse-infested.

"Some believe this can be handled by vaccination," Prof. Meyer said, "but I have yet to be convinced."

In New Guinea, Sumatra, Burma, and Thailand there are mites that transmit a type of spotted fever similar to the swamp fever of Japan. In North Africa troops will probably experience similar diseases carried by ticks. In Central Africa we find sleeping sickness. To combat this we have a prophylactic, Bayer 205, which gives protection for three months.

There are also many other medical problems in a global war. In desert warfare heat-stroke must be dealt with, and sinus infections that tend to flare up. In the swampy battlegrounds there are liver flukes. In our army of eleven or twelve million men we shall find only the particularly fit individuals can be sent into certain regions. A great many who have been sent will have to be returned and replaced by others.

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The *population* of the world has increased from an estimated 500,000,000 in 1740 to 2,000,000,000 in 1940.

ENGINEERING

Food Coolers Tough

A 10,000-pound refrigerator which withstands a drop to a concrete platform, whose parts are unaffected by ocean dunking, protects fighters' food.

➤ A NEW MILITARY refrigerator crashes to a concrete platform with the full impact of its 10,000-pound hulk. Naval inspectors open the doors to reveal the insides of the unit still intact; the motor starts with a purr at the throw of a switch.

How this same test was successfully met a half dozen times by the same giant portable refrigerator in a day's testing at a naval base was described to the meeting of the American Society of Refrigerating Engineers in Cleveland by Mark Mooney of the Carrier Corporation, Syracuse, N. Y.

Several companies are now building these portable units for use in carrying frozen foods and perishable medical supplies to the armed forces, Mr. Mooney announced.

After a shipload of perishable supplies reaches the battle arena, facili ies must be available for cold storage. The Army, Navy and Marine Corps were all faced with this same problem.

The demountable walk-in cooler was the answer cooperatively devised by engineers of many manufacturers.

Designed for use under battle conditions, these coolers have interchangeable parts. If a strafing plane knocks out the condenser unit of the camp's cooler, replacement can be made from a spare part made by any of the companies and the vital boxful of arctic cold goes right on with the job of protecting food and drug supplies.

In the early days of the war, Mr. Mooney revealed, the importance of spare parts and tools to repair disabled refrigerators was overlooked, with resultant supply problems.

Now spare parts must be rustproofed and individually packed to withstand rust and corrosion for at least three years in any climate. Parts must be often dumped overboard into shallow water along with other cargo, to be fished out by the armed forces when it is is convenient and safe to do so.

Praising the refrigerator industry for the job it had done, Mr. Mooney called for still more research to find better ways of protecting perishable supplies for soldiers in the field.

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MEDICINE

Color-Blind Aided

"Alleged cure" for inability to distinguish colors is said to teach, not cure those afflicted, but it did enable men to pass service tests.

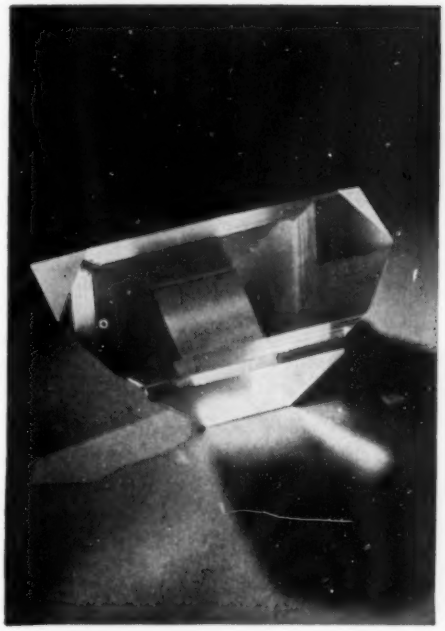
➤ AN "ALLEGED CURE" for color blindness is actually succeeding in getting into the Navy and the Air Force men who had been previously rejected by these services, an investigation by the American Medical Association reveals.

Color blindness is a congenital defect for which no "cure" is known to medical authorities. The success of the method just investigated is a matter of teaching, not of treatment or "cure", it appears from the report of the investigation (*Journal, American Medical Association,* June 5).

The "alleged cure" is said to have been developed by J. H. Lepper, optometrist, of Mason City, Iowa. Following criticism of the claims for the method in a previous issue of the medical journal, Mr. Lepper submited complete details of his method and a list of men "now in the Navy and in the Air Force who had previously been rejected but were accepted after having followed his technic."

The information as to these men was verified by appropriate agencies in Washington to whom the American Medical Association referred the material.

Investigators for the medical association then visited certain optometrists in the eastern United States who follow the Lepper technic and studied their results. These investigators believe that the Lep-



THE MOST "PRECISE" ARTICLE MANUFACTURED IN QUANTITY ANYWHERE

Illustrated above is a roof prism, the most accurate of all optical parts, used in military instruments for our armed forces.

Roof prisms are being made by a number of manufacturers by methods first developed at The Perkin-Elmer Corporation, and gladly shared in the interest of winning the war.

THE PERKIN-ELMER CORPORATION
GLENBROOK, CONNECTICUT
MANUFACTURERS OF PRECISION LENSES - PRISMS and MIRRORS
OPTICAL DESIGN AND CONSULTATION

per method is educational rather than curative. Apparently the men learn to associate something about the appearance of test objects with its color as given by name or by a non-color-blind person.

Reexamination of these men at a later date, using a different technic, would probably, the medical journal states, show that they still are color blind.

Obviously, it is up to the armed services, the journal editorial comments, to determine whether the color blindness tests now are sufficient to screen out enough color blind persons or whether or not a young man willing to put in the time and effort required to learn enough about the tests to pass them "would not qualify because of superior learning ability or intelligence to meet the needs of the armed forces."

As to Mr. Lepper and his followers, the medical journal advises them to limit promotion of their method to the statement that they teach men to pass the tests for color vision and to avoid carefully the use of the word "cure."

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NUTRITION

Post-War Grocery Store

Few "fresh" vegetables will be sold in the post-war grocery, but hundreds of frosted foods, some ready-cooked, will be available for the housewife.

➤ CORNER GROCERY STORES, particularly those in small villages, will be different after the war, Clarence Birdseye, of Gloucester, Mass., pioneer in developing modern frozen foods, predicted at meeting of the Institute of Food Technologists in St. Louis.

Instead of bins full of tomatoes, spinach and other "fresh" vegetables, it will have a series of low-temperature self-service cabinets. There the housewife even in a remote village, will find frosted cooked vegetables, including tropical and Arctic delicacies. When she gets home, she will put them in the frosted food compartment of her post-war refrigerator.

Probably very few unprocessed fresh vegetables will be sold, Mr. Birdseye said. Where at present only about one American grocery in 11 carries quick frozen foods, later all of them will. Instead of the 65 frosted food items at present available, there may be several hundred, including scores of frosted cooked foods. Every home refrigerator will have its frosted food compartment.

With lowered trade barriers and world-wide refrigeration facilities, Mr. Birdseye said, there will be no international boundaries to perishable food distribution.

"Huge mechanically operated farms and processing plants," he continued, "will center around such virgin areas as Grand Coulee dam and produce unbelievable tonnages at very low costs, thus seriously affecting less efficient farming. Low-temperature locker plants will multiply in urban and rural communities.

"The perishable food business of the future offers an unlimited field for technical research and large scale development."

Present importance of frozen foods for saving both tin plate and transportation space were described by Mr. Birdseye as follows:

"Operating only 40 weeks annually, one Birdseye freezer weighing five tons can freeze in paper cartons 375,000,000 pounds of peas which would require over 4,500,000 cans comprising eight tons of pure tin and 500 tons of steel.

"One freight car of Birdseye frosted spinach contains as many edible portions as 11 cars of fresh spinach. If this saving could have been applied to all fresh vegetables moved by rail in 1942, there would have been a saving of 138,200 carloads."

Public acceptance of quick frozen packaged foods has advanced by at least five years because of the war, Mr. Birdseye said, giving as reasons the increased public buying power; large purchases by the armed forces; shortages of canned foods; excellent vitamin retention; and rationing.

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ENGINEERING

New Process for Making Tin Cans Here to Stay

➤ THE ELECTROLYTIC process now employed in making tin cans will continue in use after the war, Dr. Charles Olin Ball, technical director of the Owens-Illinois Can Company, told members of the Institute of Food Technologists meeting in St. Louis.

This revolutionary change in the process was evolved because of the necessity of conserving tin, but is more efficient, more economical, and produces a better quality can than the old hot dip method, Dr. Ball stated.

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Soybeans, a good meat substitute because rich in proteins, contain ten times as much fat as ordinary household beans.

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WILDLIFE

NATURE RAMBLINGS

by Frank Thone

Vanished Handouts

➤ BEARS in our national parks may wonder a little, during the coming travel season, what has become of the easy pickings they used to have for food. Time was, when even the laziest bear could get butter-fat in a summer, just turning up regularly at the hotel garbage dumps and stuffing himself with the nourishing (even if somewhat odoriferous) tidbits, while crowds of fascinated tourists looked on. Yellowstone Park in particular used to be famous for its "bear dumps" where you could see not only numbers of the ordinary American or black bears but also the much shyer and rarer species, the great grizzly.

A few years ago, a new park policy took the bears "off relief," closing all but one of the feeding grounds in each of the larger bear-frequented parks. This was intended for the bears' own welfare; it was considered best for the bruins to oblige them to return to their old, native ways of rooting for their own roots, grubbing for their own grubs. The few feeding grounds left open represented a compromise, a concession to the desire of the tourists who got a real thrill out of watching bears in the open, without any separation of bars or pits between them and the great wild beasts.

Bears at the feeding grounds ordinarily ignored the visitors; they were too busy eating. A few black bears, however, became more intimate with their temporary human neighbors, halting cars on the roads to beg for gifts of cookies, chocolate bars or anything else edible—they would even gulp down cigars, if offered.

Now all this is changed. Far fewer tourists are visiting the parks in the West during these war years—people are too busy, they haven't the necessary tires and gas, and they're putting a good deal of what used to be vacation money into bonds and war stamps. Less travel of course means fewer guests in the hotels and camps, and that in turn means less garbage to dump out where the bears come to feast. Likewise, there are fewer cars for the "holdup" bears to stop, and because of sugar rationing those that they do hail will not be able to reward their begging with anything like the old-time largesse of chocolate bars and other sweets.

Bears have not only been taken "off relief"; they have been regimented into the national rationing system. They can count themselves lucky if they are not asked to present appropriately colored and numbered stamps when they come around at feeding-time!

Science News Letter, June 12, 1943

SEISMOLOGY

Two Quakes in Two Days Recorded on Seismographs

➤ TWO EARTHQUAKES in two days, one near the island of Mindanao in the Philippines, the other off the west coast of Mexico, were recorded at widely distributed seismological observatories on Tuesday and Wednesday, May 25 and 26. Data transmitted telegraphically through Science Service were interpreted by scientists of the U. S. Coast and Geodetic Survey, who determined the epicenters.

The Tuesday earthquake, which was located in or near the deepest of suboceanic valleys, the Mindanao Deep, was rated as a strong shock, although it is unlikely that much damage ashore was caused. Its epicenter was located in latitude 7.5 degrees north, longitude 126.5 degrees west; time of origin was 7:07:36 p.m., EWT.

The earthquake on Wednesday had its epicenter in latitude 17.5 degrees north, longitude 106.5 degrees west; time of origin was 6:31:25 a.m., EWT.

Seismological data were sent in by government observatories in Sydney, Australia; Wellington, New Zealand, and Ottawa, Canada; the stations of the Jesuit Seismological Association at St. Louis University, Fordham University and Spring Hill College near Mobile, Ala.; the Des Moines Seismological Observatory; and the stations of the U. S. Coast and Geodetic Survey at Apia, Samoa, San Juan, P. R., Sitka, Alaska, Honolulu, T.H., and Tucson, Ariz.

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● RADIO

Saturday, June 19, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Walter J. Murphy, editor of Industrial and Engineering Chemistry, will talk about Chemistry and the War.

BOTANY

Oyster Mushroom Tasty As Well As Handsome

See Front Cover

➤ CONSIDERABLE to-do is made of the fact that chemists are able to convert wood into edible substances. Many species of mushrooms have been doing that for uncounted centuries, with no fuss made about it. One of the most successful of such is the genus Pleurotus, which is always found growing on decaying trees or stumps. The flavor of this mushroom is, to most connoisseurs, definitely better than that of the ordinary mushroom of the markets, though its flesh is a trifle less tender. Because some fancy a resemblance in flavor to oysters, the commonest species of this genus is called *P. ostreatus,* or oyster mushroom.

That this mushroom can appeal to the esthetic as well as the gustatory sense is evidenced by the fact that the photograph reproduced on this week's SCIENCE NEWS LETTER cover has been awarded a prize at the Fifth International Salon of Nature Photography, conducted by *Hobbies,* official publication of the Buffalo Museum of Science. The picture is by Miss Juanita Schubert of Minden, Nev.

Science News Letter, June 12, 1943

MATHEMATICS DICTIONARY

Invaluable in reading any book that uses mathematics.

THE JAMES MATHEMATICS DICTIONARY,

the only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations, the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and the tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one."

Available in either flexible or non-flexible, blue fabrikoid binding, for $3.00, from the Digest Press, Van Nuys, California, or Science News Letter.

TEC-W-2171

• New Machines and Gadgets •

⚙ *IN ARCTIC countries soldiers' feet will be protected by new wool insoles a half-inch thick. Each one is made of two perforated wool felt pads hinged by a five-inch stitched seam on one side. The 100 perforations in each sole insure ventilation.*

Science News Letter, June 12, 1943

⚙ *A SHAPE-CONFORMING boot now protects highly finished machine parts from injury. An outside sleeve of steel and cotton mesh with a cotton mesh lining prevents contact with hard surfaces, retains the oil film, and keeps out foreign matter.*

Science News Letter, June 12, 1943

⚙ *GLASS V-JEWELS, used with steel pivots as bearings in small instruments, are the equal of imported sapphire jewels, now hard to get. A new process cuts the V-shaped depression in special glass so that the steel pivot fits with great accuracy.*

Science News Letter, June 12, 1943

⚙ *LABORATORY GLASSWARE made of 96 per cent silica glass has been recently developed. It has low thermal expansion, high softening point, and exceptional chemical stability.*

Science News Letter, June 12, 1943

⚙ *THE PORTABLE melting furnace and ladle combination shown in the picture has been developed to speed the casting of aluminum war equipment. A removable burner attached to the side-*

wall heats the 1000-pound charge. The outfit does away with superheating the metal and eliminates preheating the transfer ladles.

Science News Letter, June 12, 1943

⚙ *A GLOSSMETER measures the reflecting gloss of paints, paper and polished surfaces. It will register changes due to age, use, or climatic conditions. A search unit, attached to an indicating instrument with an electric cord, is placed against the glossy surface. A light source inside is directed against the surface; reflected light strikes on a measuring photo-cell.*

Science News Letter, June 12, 1943

⚙ *A NEW HAND TOOL cuts engravings on steel, leather, wood, stone or rubber, it is claimed. Ordinary alternating current operates a vibrator giving 120 vertical strokes a second. Identification marks can thus be put on tools, dies, jigs, and other parts.*

Science News Letter, June 12, 1943

⚙ *PLYWOOD SCRAP, trimmed from panels in the mill, is being used as a substitute for steel in bridge decking and waterfront piers. Strips are glued together, bound with small steel plates and covered with concrete.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 160.*

• Just Off the Press •

AMERICAN STANDARDS — *American Standards Ass'n.*, 20 p., pamphlet. Free upon request to American Standards Ass'n., 29 W. 39th St., New York. This will serve as a useful reference piece to the engineering and purchasing departments of manufacturing firms.

AN INTRODUCTION TO HISTORICAL PLANT GEOGRAPHY — E. V. Wulff — *Chronica Botanica, G. E. Stechert*, 223 p., illus., $4.75.

CHEMICAL FORMULARY. Vol. 6—H. Bennett—*Chemical Pub. Co.*, 636 p., $6. "A collection of valuable, timely, practical formulae and recipes for making thousands of products in many fields of industry."

ELEMENTARY STATISTICAL METHODS — Helen M. Walker—*Holt*, 368 p., illus., $2.75. Intended particularly for students of education.

RESEARCH ON EARLY MAN IN BURMA—Hellmut De Terra and Hallam L. Movius, Jr.—*American Philosophical Society*, 464 p., illus., $3. (Transactions of the American Philosophical Society. New Series. Vol. XXXII, Pt. III)

SYMPOSIUM ON RADIOGRAPHY—American Society for Testing Materials—*American Society for Testing Materials*, 256 p., illus., $4. Includes technical papers by outstanding authorities.

THE RISE OF THE ELECTRICAL INDUSTRY —Malcolm MacLaren — *Princeton Univ. Press*, 225 p., $3.75.

WALTER REED: Doctor in Uniform—L. N. Wood—*Messner*—277 p., illus., $2.50.

• Glances at New Books •

➤ RIVERS are streams of adventure and romance. Such a river is described in THE AMAZON: THE LIFE HISTORY OF A MIGHTY RIVER, by Caryl P. Haskins (*Doubleday, Doran*, $4). The book, not only describes the Amazon but country through which it flows.

Science News Letter, June 12, 1943

➤ THE WHOLE WORLD is in flux in the fiery furnace of war, and many things are certain to set in changed patterns when cooling finally ensues. It is therefore exceedingly timely that a new and authoritative source-book has appeared of which the title tells its scope: INTERNATIONAL AGREEMENTS ON CONSERVATION OF MARITIME RESOURCES, by Jozo Tomasevich. Whether we undertake to restore old ways, or strive to make all things new, we shall need the guideposts to past progress that are clearly outlined here. (*Food Research Institute, Stanford Univ.*, $3).

Science News Letter, June 12, 1943

➤ JAMES H. BREASTED lived so long among the great monuments of the past that now he has become one with the past himself he begins to loom monumental to those who knew him. The story of a great man is well told by an able son, in PIONEER TO THE PAST (*Scribner's*, $3.50).

Science News Letter, June 12, 1943